

TITLE OF THE INVENTION

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING
REDUCED CROSS-TALK NOISE

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now US patent No. 6,664,638*

5 **BACKGROUND OF THE INVENTION**

1. Field of the Invention

The present invention generally relates to semiconductor integrated circuits, and particularly relates to a semiconductor integrated circuit which has cross-talk noise thereof reduced by shielding wire lines.

2. Description of the Related Art

In electric circuits, inductance coupling and capacitance coupling between signal lines cause cross-talk noise. The greater the inductance coupling and capacitance coupling between lines, the greater the cross-talk noise is. In semiconductor devices such as large-scale integrated circuits, inductance coupling and capacitance coupling between lines increase as the circuit density increases, thereby causing noise to appear more conspicuously. In order to reduce cross-talk noise caused by the inductance and capacitance coupling, shielding wire lines are used.

25 Use of shielding wire lines gives rise to problems in that they have relatively large wiring resistance per unit length.

First, large wiring resistance results in electric charging and discharging in the shielding wire lines being slowed, thereby reducing a shielding effect.

Second, when a shielding wire line is connected to the ground voltage or to the power supply voltage at several points along the line, an excessively large current runs through the shielding wire line, causing the problem of E-MIG (electro migration). The E-MIG occurs when the